

REMARKS

The pending Office Action is the first Office Action following Applicants' request for continued examination. Claims 1-4, 8, 9, 11-17 and 20-29 are pending, including independent claims 1, 8, 13, 17, 22 and 26. All claims have again been rejected on the basis of prior art, but the Examiner has cited some different references to address the arguments in Applicants' previous response.

Claims 1, 8, 11-12, and 21 were rejected under 35 U.S.C. § 103(a) as obvious over Sasaki and a new reference, USP 6,061,456 ("Andrea"). Applicants believe Sasaki is not applicable for the reasons explained previously. In addition, Applicants disagree with the Examiner's conclusion that placing the two microphones in front of and above the position of the speaker's mouth by approximately the same distance would have been obvious from Sasaki. Sasaki nowhere suggests this specific placement of microphones. Nevertheless, Applicants have amended claim 1 to clarify that "both microphones are positioned in front of and above the position of the speaker's mouth by approximately the same distance," to avoid a possible incorrect interpretation that one microphone is positioned directly in front of the speaker's mouth by a certain distance and the other microphone is positioned directly above the speaker's mouth by the same distance.

Regarding claim 1, the Examiner agrees Sasaki does not teach that the angles formed by the orientations of the two microphones with respect to the speaker's vocalizing direction are approximately 0° and 45° , but states that Andrea teaches this in Fig. 7B. Applicants disagree. First, the Figure is not drawn to scale. The explanatory text states that Fig. 7B shows a "geometric situation" and actually teaches that the distance b between the two microphones should be much smaller than the distance r to the sound source A (col. 23, lines 29-33, 37; col. 24, lines 18-24). In this situation, the angle between each microphone and the sound source will be almost identical. Second, Fig. 7B in Andrea is depicting the relative positions of the microphones in relation to the sound source, but does not address the orientations of directional microphones with respect to the sound source, which is what claim 1 addresses. To the contrary, the portions of Andrea discussing the orientations of directional microphones

(e.g., Figs. 3B, 6A, 9A-B, and corresponding text) do not describe, and actually teach away from, Applicants' specific, claimed configuration.

Regarding independent claim 8, the Examiner agrees Sasaki does not teach spacing the microphones approximately 9 cm apart, positioning the microphones in front of and above the position of the speaker's mouth by approximately the same distance, and that the angles formed by the orientations of the two microphones with respect to the speaker's vocalizing direction are approximately 0° and 60° , but states that Andrea teaches these features. Applicants disagree.

The Examiner again cites Fig. 7B of Andrea as support. However, this Figure says nothing about a 9 cm spacing, but rather teaches away from this feature by describing that the distance b between the two microphones should be much less than the distance r to the sound source, as explained above. Fig. 7B also says nothing about placing both microphones in front of and above the position of a speaker's mouth by approximately the same distance. In fact, the Figure contains no distance data and no elevation data. Finally, Fig. 7B does not show the 0° and 60° orientations of directional microphones. As explained above, this Figure does not even show orientations of directional microphones, and the angles of the microphones with respect to sound source A are almost identical because b is much less than r .

However, as for claim 1, Applicants have amended claim 8 to clarify that both microphones are positioned in front of and above the position of the speaker's mouth by approximately the same distance.

Independent claim 13 and dependent claim 14 were rejected under 35 U.S.C. § 103(a) as obvious over Romesburg in view of newly cited USP 4,658,426 ("Chabries"). The Examiner agrees Romesburg does not teach that a first adaptive signal processor receives an output signal from one microphone and an error signal and provides an output signal to a subtracter, a second adaptive signal processor receives an output signal from the other microphone and said error signal and provides an output signal to said subtracter, and the subtracter outputs said error signal, the first and second adaptive signal processors executing adaptive signal processing to minimize the power of said error signal, but states that Chabries teaches these features. To clarify

Applicants' invention, Applicants have amended claim 13 to state that "the subtracter outputs said error signal as a difference between said output signals." This is not shown or suggested in Chabries.

Regarding dependent claim 14, Fig. 2 in Romesburg does not teach a microphone disposed almost directly above the face of a speaker as the Examiner asserts. If anything, the microphone 22 is shown in front of and slightly below the speaker's face. Nevertheless, Applicants have amended claim 14 to add that both microphones are positioned at about the same height above a speaker's mouth. This feature further distinguishes over the cited art.

Dependent claims 15 and 16 were rejected under 35 U.S.C. § 103(a) as obvious over Romesburg and Chabries as applied to claim 13, and further in view of Lange. The Examiner agrees that Romesburg and Chabries fail to teach a microphone system wherein the other microphone is spaced apart on the occipital side from the position of the one microphone, and a microphone system wherein the other microphone is spaced apart on the occipital side by about 1 to 5 cm from the position of the one microphone, but states that Lange teaches these features. Applicants disagree. First, as explained above, the underlying combination of Romesburg and Chabries does not disclose the subject matter of independent claim 13 or dependent claim 14, and Lange does not cure this defect. Second, claims 15 and 16 describe the relative positions of two microphones that interact in a system to produce a speaker's voice signal with an improved SN ratio, where the SN ratio of the output signal from one microphone is raised while the SN ratio of the output signal from the other microphone is lowered. This is not suggested by Lange, where the English language abstract describes that the two microphones 1a, 1b represent "differently acting subsystems" (one for near field and one for far field). Third, regarding claim 16, Lange does not describe a second microphone spaced apart about 1 to 5 cm, on the occipital side, from a microphone "disposed almost directly above the face of a speaker," as claimed. The Examiner relies on microphones 1a and 1b at the back of the car in Fig. 1 of Lange to correspond to the first and second microphones of Applicants' claim. However, the identified microphone 1a is not positioned "almost directly above the face of a speaker," the

identified microphone 1b is not positioned to the occipital side of that microphone 1a, and there are no dimensions stated in Fig. 1 on the English translation of Lange.

Independent claim 17 was rejected under 35 U.S.C. § 103(a) as obvious over Romesburg and Lange. First, Applicants note that Romesburg does not show a microphone disposed substantially directly above the face of a speaker. Microphone 22 is shown positioned noticeably in front of the speaker's face. The Examiner agrees Romesburg does not teach that the other microphone is spaced apart on the occipital side by about 1 to 5 cm from the position of the one microphone, but states that Lange teaches this feature. Applicants disagree, as explained in detail above for claims 15 and 16.

Independent claim 22 was rejected under 35 U.S.C. § 103(a) as obvious over Sasaki in view of newly cited USP 5,208,864 ("Kaneda") and Andrea. The Examiner agrees Sasaki does not teach that the microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance, are oriented substantially perpendicularly to the speaker's vocalizing direction, and are spaced apart from one another in the vocalizing direction by approximately 7.5 cm, but states that these features are found in Kaneda and Andrea. The Examiner asserts that Kaneda teaches a microphone system wherein microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance (Fig. 2(b), microphone 2), but Applicants disagree. That Figure shows two microphones, with one microphone positioned in front of the speaker's face and another microphone positioned to the side of the speaker's face. To clarify Applicants' claimed invention, Applicants have amended claim 22 as for claim 1 to recite that "both of said microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance." This is not shown or suggested in Kaneda.

The Examiner also notes that Sasaki as modified by Kaneda does not teach that the microphones are oriented substantially perpendicularly to the speaker's vocalizing direction and are spaced apart from one another in the vocalizing direction by approximately 7.5 cm, but finds these features in Andrea (Fig. 9c). Applicants disagree. The Examiner points to microphones 302 and 450. However, microphone 450 is an

omnidirectional microphone (col. 20, lines 36-38), not a directional microphone as claimed, and therefore is not oriented relative to the speaker's vocalizing direction. Although microphone 302 may be a directional microphone, it is not positioned above and to one side of a speaker's mouth as claimed. The Examiner guesses that the microphone 302 may be rotated so as to become oriented perpendicular to the vocalizing direction, but Andrea does not describe that the boom assembly 413 can even be rotated in this way, or that the system could operate properly in this configuration. Further, the microphone 302 is paired with microphone 300, not microphone 450 (e.g., col. 19, lines 11-28), and the two-microphone noise reduction system 300, 302 does not at all describe or suggest Applicants' claimed invention.

Independent claim 26 was rejected under 35 U.S.C. § 103(a) as obvious over Sasaki in view of Kaneda. Applicants disagree with the Examiner's assertion that Sasaki teaches a system comprising two directional microphones, wherein one microphone is oriented substantially perpendicularly to the speaker's vocalizing direction, the other microphone is oriented at an acute angle relative to the orientation of the one microphone, and the microphones are spaced apart from one another in the vocalizing direction by about 2 cm. The cited passages of Sasaki do not show the orientations of two directional microphones at an acute angle: Fig. 3 doesn't even have two directional microphones, Fig. 6 shows a 180° angle, and Fig. 7 shows at most a 90° angle. Sasaki also does not identify a specific spacing between microphones of about 2 cm.

The Examiner agrees Sasaki does not teach that the microphones are positioned above and to one side of the position of a speaker's mouth by approximately the same distance, but states that this feature is taught by Kaneda. However, as explained above for claim 22, Kaneda does not at all teach this configuration. Nevertheless, Applicants have amended claim 26 as for claim 22 to clarify the claim and distinctions over the prior art.

The remaining dependent claims not expressly addressed in this response are patentable over the cited art for at least the same reasons discussed above for their antecedent claims.

In summary, Applicants submit that the claims, as amended, patentably distinguish over the cited art. Applicants therefore respectfully request reconsideration and allowance of this application in view of the foregoing amendments and remarks.

Respectfully submitted,


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